IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:	Group Art Unit: 3762
Yelena Nabutovsky	Examiner: Flory, Christopher A.
Serial No.: 10/687,846	Atty Docket No.: A03P3002-US1
Filed: October 17, 2003	
Title: Multifocal PVC Detection for Prevention of Arrhythmias	

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February 29, 2008
Esther Campbell

APPEAL BRIEF

Honorable Commissioner:

This is an Appeal Brief filed pursuant to 37 CFR § 41.37 in response to the Notice of Panel Decision from Pre-Appeal Brief Review of January 30, 2008 and the Final Office Action of October 6, 2006, and pursuant to the Notice of Appeal filed January 8, 2007.

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[1] Applicant notes for the record that the claims are not limited to the various exemplary embodiments discussed in the "Summary of the Claimed Subject Matter" portion of this Brief. Reference to particular figures, reference numerals and portions of the application are being made solely in order to allow the Board to quickly determine where an exemplary embodiment of each of the claimed inventions is illustrated and described in the application in accordance with 37 C.F.R. § 41.37(c)(I)(v) and MPEP § 1205.02.

I. REAL PARTY IN INTEREST

The real party in interest in accordance with 37 CFR § 41.37(c)(l)(i) is the patent assignee, Pacesetter, Inc. ("Pacesetter"), a Delaware corporation having a place of business at Sunnyvale, California 94086, which is a wholly owned subsidiary of St. Jude Medical, Inc., a Minnesota corporation having a place of business at St. Paul, Minnesota 55117, a publicly held corporation that trades on the New York stock exchange under the symbol STJ.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences within the meaning of 37 CFR § 41.37(c)(l)(ii).

III. STATUS OF CLAIMS

Status of claims in accordance with 37 CFR § 41.37(c)(l)(iii): Twenty eight claims were filed in the original application in this case. Claims 1-28 were rejected in the Final Office Action. Claims 1-28 were rejected in the Notice of Panel Decision from Pre-Appeal Brief Review. Claims 1-28 are on appeal.

IV. STATUS OF AMENDMENTS

Status of amendments in accordance with 37 CFR § 41.37(c)(l)(iv): No amendments were submitted after final rejection. The claims as currently presented are included in the Appendix of Claims that accompanies this Appeal Brief.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Applicant provides the following concise summary of the claimed subject matter according to 37 CFR § 41.37(c)(l)(v), including references to the specification by page and line number and to the drawings by reference characters.

A. Background

i. Cardiac Cycle of the Heart

As depicted in Figure 3 of Applicant's Specification, a cardiac cycle consists of a P wave, representing atrial depolarization—a conduction of electrical impulses through the atria, a QRS complex, indicating ventricular depolarization, and a T wave indicating repolarization of the ventricles:

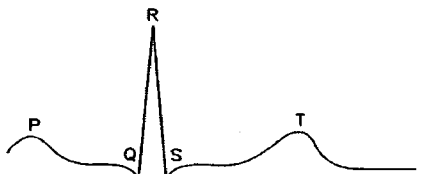


Figure 3

The PR interval (PRI) represents atrioventricular conduction time—the path of the electrical impulse from the SA node through the AV node, Bundle of His, and the right and left bundle branches.

The QRS complex follows the PRI and consists of a Q wave—the first downward deflection following the PRI, the R wave—the next upward deflection, and the S wave—the next downward deflection.

The QT interval is the part of the waveform from the beginning of the QRS complex to the end of the T wave. It reflects the length of the refractory period of the heart—ventricular depolarization and repolarization.

ii. Multifocal Premature Ventricular Contractions (PVCs)

PVCs occur when the ventricles of the heart depolarize before receiving the correct electrical signal from the atria. As described on p. 14, ll. 10-13 of Applicant's Specification, a PVC may be determined to have occurred when the interval between R waves of two consecutive cardiac cycles is shorter than an average R-R interval. As described on p. 13, l. 12-p. 14, l. 4, and depicted in Figures 4A and 4B of Applicant's Specification, PVCs can be classified according to where they arise within the heart. Unifocal PVCs 402 and 404 arise from the same source with respect to one another, so they look the same on an electrocardiogram (i.e., the QRS complexes look the same):

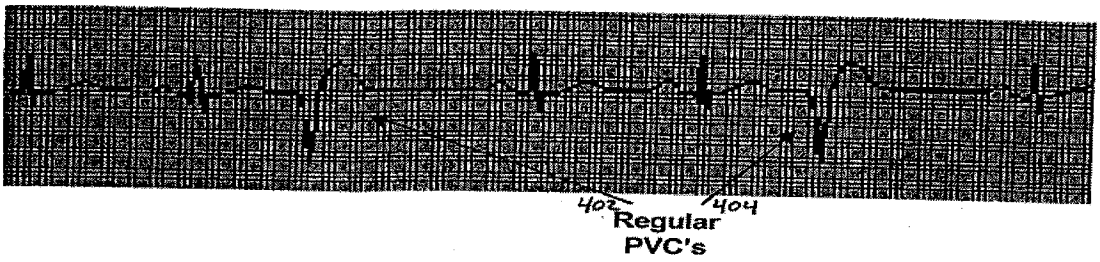


Figure 4A

Multifocal PVCs 406 and 408 arise from different sources. This makes them look different from each other on an electrocardiogram (i.e., the QRS complexes look different):

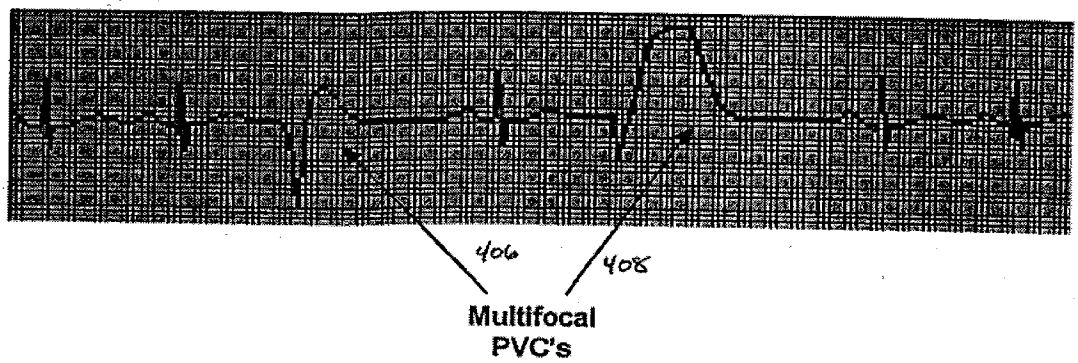


Figure 4B

Applicant discloses that Multifocal PVCs can be detected by using a morphology algorithm, by measuring coupling interval variability, or by using both for greater specificity.

B. Independent Claim 1

Referring to Figs. 5 and 6, which are reproduced below, and to page 14, line 5-page 18, line 22, independent claim 1 is directed to a "method of detecting and preventing ventricular arrhythmias" [Fig. 5, reference 500, p. 14, ll. 5-6; Fig. 6, reference 600, p. 17, ll. 16-p. 18, l. 22]. The claimed method comprises: "detecting at least two premature ventricular contractions (PVCs)" [Fig. 5, reference 502, p. 15, ll. 9-16 and reference 506, p. 15, ll. 11-12; Fig. 6, reference 602, p. 17, ll. 25-27 and reference 606, p. 18, l. 1], and "determining a difference between morphologies of the at least two PVCs" [Fig. 5, reference 512, p. 14, ll. 19-27, p. 16, ll. 20-26; Fig. 6, reference 610, p. 18, ll. 5-6], "comparing said difference to a predetermined morphology threshold" [Fig. 5, reference 512, p. 16, l. 27-p. 17, l. 1; Fig. 6, reference 610, p. 18, ll. 6-9]; and "determining whether to deliver preventive therapy based on said comparing step" [Fig. 5, reference 518, p. 17, ll. 1-6; Fig. 6, reference 612, p. 18, ll. 9-13].

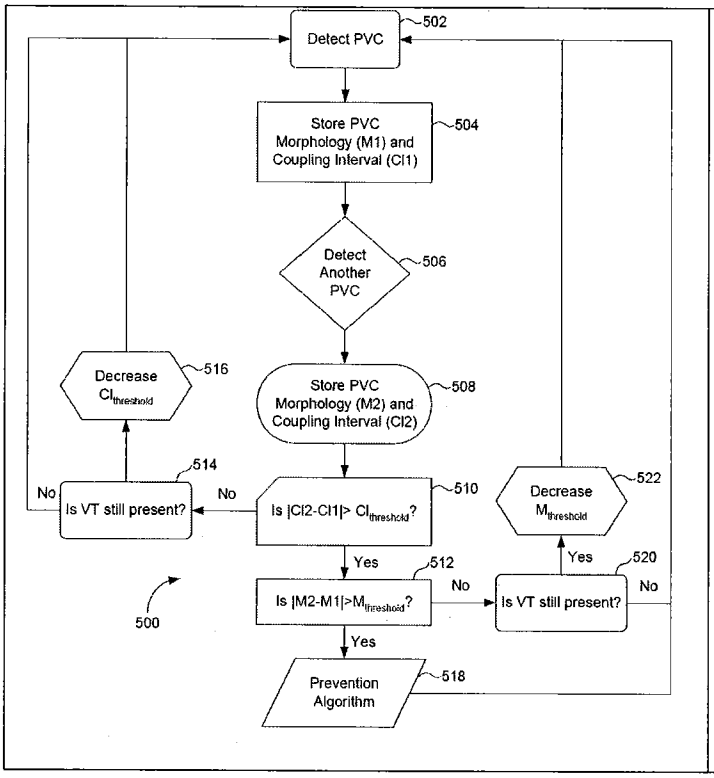


Figure 5

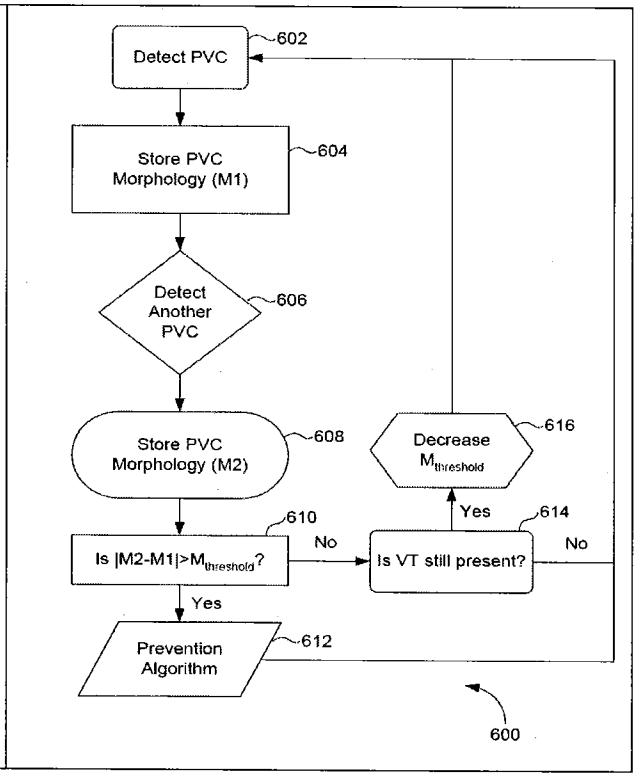


Figure 6

C. Independent Claim 13

Referring to Figs. 1 and 2, which are reproduced below, and to page 4, line 7-page 12, line 20, independent claim 13 is directed to an "apparatus configured to detect and prevent ventricular arrhythmias" [Fig. 1, reference 110, p. 4, ll. 7-18; Fig. 2 reference 210, p. 4, ll. 8-9, p. 7, ll. 4-6, p. 10, ll. 23-p. 1, l. 6]. The claimed apparatus comprises the following means plus function claim elements permitted by 35 U.S.C. § 112, sixth paragraph, and the structure, material, and acts described in the specification as corresponding to each claimed function are identified with reference to page, paragraph number, and drawing reference number as follows.

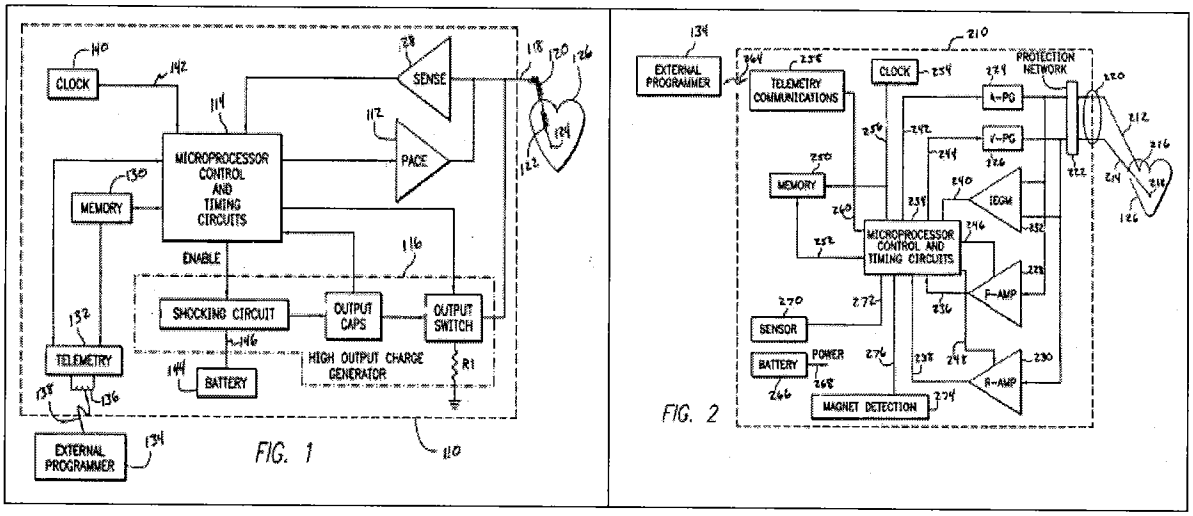
detecting means configured to detect at least two premature ventricular contractions (PVCs) [FIG. 1, sense amplifier, sampler, or sensing circuit (128), p. 5, ll. 8-15, p. 15, l. 11), p. 17, ll. 25-27; Fig. 2, atrial channel sense amplifier (P-AMP)(228), p. 8, ll. 1-10, ventricular channel sense amplifier (R-AMP)(230), p. 8, ll. 3-10, electrodes (216 and 218), p. 8, ll. 1-5, leads (212 and 214), p. 8, ll. 1-5, IEGM amplifier (232), p. 8, ll. 11-15]

processing means configured to determine a difference between morphologies of each of the at least two PVCs [FIG. 1, control/timing circuit (114), p. 5, l. 21-p.7, l. 4; p. 6, l. 24-p.7, l. 4, p. 14, ll. 19-27; Fig. 2, control/timing circuit (234), p. 8, l. 20-p. 9, l. 30]

comparing means configured to compare said difference to a predetermined morphology threshold [FIG. 1, control/timing circuit (114), p. 5, l. 21-27, p. 6, l. 24-7, l. 4, memory circuit (130), p. 5, l. 28-p. 6, l. 7, external programmer (134), p. 6, ll. 8-23; Fig. 2, control/timing circuit (234), p. 8, l. 20-p. 9, l. 30, p. 11, l. 27-p. 12, l. 20, memory circuit (250), p. 9, l. 15-27]; and

delivering means configured to deliver preventative therapy based on said comparison [FIG. 1, pacing pulse generator (112), p. 7, ll. 5-7; Fig. 2, leads (212) and (214), p. 7, ll. 30, p. 8, l. 5, electrodes (217) and (218), p. 7, l. 30-p. 8, l. 5, atrial pulse generator (A-PG) (224), p. 7, ll. 30-31, p. 8, l. 30-p. 9,

l. 5, and ventricular pulse generator (V-PG)(226), p. 7, l. 30-p. 8, l. 1, and p. 8, l. 30-p. 9, l. 5].



D. Independent Claim 17

Referring to Figs. 1 and 2 and to page 4, line 7-page 12, line 20, independent claim 17 is directed to an "implantable cardiac device" [Fig. 1, reference 110, p. 4, ll. 7-18; Fig. 2, reference 210, p. 4, ll. 8-9, p. 7, ll. 4-6, p. 10, ll. 23-p. 1, l. 6] comprising "a sensing circuit configured to sense at least two premature ventricular contractions (PVCs)" [FIG. 1, reference 128, p. 5, ll. 8-15, p. 15, l. 11, p. 17, ll. 25-27; Fig. 2, references 228, p. 8, ll. 1-10, reference 230, p. 8, ll. 3-10, reference 232, p. 8, ll. 11-15], "a comparing circuit configured to compare a difference between morphologies of each of the at least two PVCs to a predetermined morphology threshold" [FIG. 1, reference 112, p. 7, ll. 5-7, p. 14, ll. 19-27; Fig. 2 reference 224, p. 7, ll. 30-31, p. 8, l. 30-p. 9, l. 5, and reference 226, p. 7, l. 30-p. 8, l. 1, and p. 8, l. 30-p. 9, l. 5].

E. Independent Claim 23

Referring to Fig. 5 and to pages 14, l. 5-p. 17, l. 15, independent claim 23 is directed to a "method of detecting and preventing ventricular arrhythmias" [Fig. 5, reference 500, p. 14, ll. 5-6]. The claimed method comprises: "detecting at least two premature ventricular contractions (PVCs)" [Fig. 5, reference 502, p. 15, ll. 9-16 and reference 506, p. 15, ll. 11-12], "determining a difference between coupling intervals of the at least two PVCs" [Fig. 5, reference 510, p, 14, l. 28-p. 15, l. 18], comparing said difference between coupling intervals to a predetermined coupling interval threshold [Fig. 5, reference 510, p. 15, ll. 17-24, p. 16, ll. 19-20] and "determining a difference between morphologies of the at least two PVCs" [Fig. 5, reference 512, p. 14, ll. 19-27, p. 16, ll. 20-26], "comparing said difference to a predetermined morphology threshold" [Fig. 5, reference 512, p. 16, l. 27-p. 17, l. 1]; and "determining whether to deliver preventative therapy based on said comparing steps (c) and (d)." [Fig. 5, reference 518, p. 16, l. 19-p. 17, l. 6].

F. Independent Claim 27

Referring to Fig. 5 and to pages 14, l. 5-p. 17, l. 15, independent claim 27 is directed to a "method of detecting and preventing ventricular arrhythmias" [Fig. 5, reference 500, p. 14, ll. 5-6]. The claimed method comprises: "detecting at least two premature ventricular contractions (PVCs)" [Fig. 5, reference 502, p. 15, ll. 9-16 and reference 506, p. 15, ll. 11-12]," determining a difference between coupling intervals of the at least two PVCs" [Fig. 5, reference 510, p. 15, ll. 17-18], comparing said difference between coupling intervals to a predetermined coupling interval threshold [Fig. 5, reference 510, p. 15, ll. 17-24, p. 16, ll. 19-20], repeating steps (a) – (c) when said difference between coupling intervals is less than the coupling interval

threshold [Fig. 5, reference 510, p. 15, ll. 27-29]; and "comparing a difference in morphologies of said at least two PVCs to a morphology threshold when said difference between coupling intervals is greater than the coupling interval threshold" [Fig. 5, reference 512, p. 14, ll. 19-27, p. 16, l. 27-p. 17, l. 1].

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1-28 are patentable under 35 U.S.C. § 102(b) over US Patent No. 6,370,431 to Stoop, et al.

VII. ARGUMENT: REJECTION UNDER 35 U.S.C. § 102(B) OVER US PATENT NO. 6,370,431 TO STOOP, ET AL.

Applicant presents the following arguments pursuant to 37 CFR § 41.37(c)(l)(vii) regarding the grounds of rejection in the present case.

A. The Cited Reference

Stoop, et al. disclose a pacemaker system and method for analyzing patient QT information on an ongoing basis, and for determining the occurrence of statistically significant changes in a plurality of QT parameters, thereby providing an accurate determination of when torsades de pointes (TdP) or other ventricular tachycardia is indicated. For example, Stoop, et al. compare the current QT interval with a compiled mean value of the QT interval for an appropriate rate, and determine whether the QT interval has increased by more than twice the standard deviation of the mean. In other embodiments Stoop, et al. perform similar calculations for QT dispersion and the time derivative of QT changes in T-wave amplitude and morphology. (Stoop, et al., col. 2, lines 32-42). The pacemaker disclosed by Stoop, et al. also monitors premature ventricular beats and generates data representative

of such occurrences, which data is used alone or in combination with QT data in determining whether intervention is indicated, for adjusting the intervention pacing rate. (Stoop, et al., abstract).

B. The Applicable Legal Standard

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference and the identical invention must be shown in as complete detail as contained in the claim. MPEP §2131 (citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q. 2d 1051, 1053 (Fed Cir. 1987)). Further, to serve as an anticipation when the reference is silent about the asserted inherent characteristic, such gap in the reference may be filled with extrinsic evidence that makes clear that the missing descriptive matter is necessarily present in the thing described in the reference and that it would be so recognized by persons of ordinary skill in the art. *Continental Can Co. USA vs. Monsanto Co.*, 948 F.2d 1264. 1268, 20 U.S.P.Q. 2d 1746, 1749 (Fed. Cir. 1991). "Inherency . . . may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *In re Oelrich*, 666 F.2d 578, 581 (C.C.P.A. 1981).

C. Discussion Concerning Independent Claims 1, 13, 17, 23 and 27 and Claims Dependent Therefrom

Claims 1-28 stand rejected under 35 U.S.C. § 102(b) as unpatentable over US Patent No. 6,370,431 to Stoop, et al. Applicant's claimed invention, as recited in independent claims 1, 13, 17, 23 and 27, is directed toward a method and corresponding apparatus for detecting and preventing ventricular arrhythmias based upon the difference between the morphologies of at least two premature ventricular contractions (hereinafter PVCs). Stoop, et al. do

not disclose determining differences in morphologies of PVCs and comparing the difference to a predetermined morphology threshold. Applicant therefore traverses this rejection.

Claim 1 requires:

determining a difference between morphologies of the at least two PVCs;

comparing said difference to a predetermined morphology threshold

Claim 13 requires:

processing means configured to determine a difference between morphologies of each of the at least two PVCs;

comparing means configured to compare said difference to a predetermined morphology threshold

Claim 17 requires:

a comparing circuit configured to compare a difference between morphologies of each of the at least two PVCs to a predetermined morphology threshold

Claim 23 requires:

determining a difference between morphologies of the at least two PVCs;

comparing said difference between coupling intervals to a predetermined coupling interval threshold

Claim 27 requires:

comparing a difference in morphologies of said at least two PVCs to a morphology threshold when said difference between coupling intervals is greater than the coupling interval threshold

Page 2 of the Final Office Action identifies Stoop, et al.'s disclosure of

calculation of T-wave morphology as meeting these limitations of claims 1, 13, 17, 23 and 27:

> [C]ertain embodiments of Stoop, et al. do consider T-wave morphology in performing calculations to determine whether to deliver preventative therapy. Therefore, Examiner maintains that the original rejection for arguments made of record and restated below is proper, as Stoop, et al. clearly discloses using a difference in morphologies to determine whether to deliver preventative therapy (column 2, lines 10-50), since the time derivative curve of T-wave amplitude morphology as taught by Stoop, et al. is nonetheless a measure of signal morphology. Although a T-wave follows the first contraction, it also precedes any subsequent PVCs, and in this way influences and is related to a PVC.

Applicant respectfully disagrees. Applicant submits that the Examiner provides no teaching that analyzing the QT interval, including the T-wave morphology, as taught by Stoop, et al. is in any way identical to determining the difference between the morphology of two PVCs and comparing that difference to a threshold as would be required to anticipate Applicant's claimed invention. Further, the Examiner provides no teaching which indicates that the T-wave morphology (i.e., the morphology of the repolarization of the ventricle after a ventricular contraction), in any way influences the morphology of a subsequent PVC.

Applicant submits that unsupported allegations by the Examiner are not sufficient to sustain a rejection for anticipation. Moreover, Stoop, et al. do not disclose or in any way suggest determining the difference between the morphologies of at least two PVCs and comparing the difference in morphologies to a threshold.

Rather, Stoop, et al. disclose a pacemaker system and method for analyzing patient QT information on an ongoing basis, and for determining the occurrence of statistically significant changes in a plurality of QT parameters, thereby providing an accurate determination of when torsades de pointes (TdP) or other ventricular tachycardia is indicated. For example, Stoop, et al. compare the current QT interval with a compiled mean value of the QT interval for an appropriate rate, and determine whether the QT interval has increased by more than twice the standard deviation of the mean. In other embodiments Stoop, et al. perform similar calculations for QT dispersion and the time derivative of QT changes in T-wave amplitude and morphology. (Stoop, et al., col. 2, lines 32-42).

Thus, in some embodiments, Stoop, et al. compare the morphology of a current T-wave to a compiled mean value of the T-wave. However, Stoop, et al. do not disclose or suggest determining the morphology of two PVCs or determining whether to deliver preventive therapy based on a comparison of the difference between the morphologies of the two PVCs and a threshold as recited in Applicant's claimed invention. Further, the Examiner provides no indication as to how comparing the morphology of a current T-wave to a stored mean value is equivalent to determining the difference in the morphology of two PVCs and comparing that difference to a threshold as recited in Applicant's claimed invention.

Stoop, et al. further disclose that in some embodiments the pacemaker of Stoop, et al. determines whether a ventricular extra systole (VES)[2] has occurred, and if so, what has been the recent rate of occurrence of VESs. This data is used to calculate whether pacing at an intervention rate above the patient's natural rate is indicated, and if so how to adjust the intervention

[2] Stoop, et al. use the term Ventricular Extra Systole (VES) synonymously with PVC. (Stoop, et al., col. 1, lines 28-29).

rate. (Stoop, et al., col. 2, lines 42-47). In these embodiments Stoop, et al. analyze the rate of occurrence of PVCs, not the difference between the morphologies of at least two PVCs.

Applicant submits that comparing the morphology of a current T-wave to a compiled mean value of the T-wave is not sufficient to anticipate a method and device that determines the difference in the morphology of two PVCs and compares that difference to a morphology threshold to detect a need for preventive therapy as recited in Applicant's claimed invention. Applicant further submits that a system that analyzes the rate of occurrence of PVCs when determining when to deliver therapy is not relevant to the presently claimed invention. Applicant therefore submits that independent claims 1, 13, 17, 23 and 27 and all claims which depend therefrom, are patentable over the cited art.

VIII. CONCLUDING REMARKS

Applicant submits that Stoop, et al. does not disclose each and every element as set forth in Applicant's claimed invention and thus does not anticipate Applicant's claimed invention. Applicant therefore submits that the Examiner's reliance on Stoop, et al. to support an anticipation rejection of the currently pending claims is improper. Applicant believes that the present application is in condition for allowance.

The U.S. Patent and Trademark Office is hereby authorized to charge any fee deficiency, or credit any overpayment, to our Deposit Account No. 22-0265. Should such fees be associated with an extension of time, applicant respectfully requests that this paper be considered a petition therefor.

Respectfully submitted,

Dated: 2/29/08

By: Theresa A. Takeuchi
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APPENDIX OF CLAIMS
ON APPEAL IN PATENT APPLICATION OF
YELENA NABUTOVSKY, SERIAL NO. 10/687,846

CLAIMS

What is claimed is:

1. A method of detecting and preventing ventricular arrhythmias, comprising:

a. detecting at least two premature ventricular contractions (PVCs);

b. determining a difference between morphologies of the at least two PVCs;

c. comparing said difference to a predetermined morphology threshold; and

d. determining whether to deliver preventive therapy based on said comparing step.

2. The method of claim 1, further comprising the step of:

e. delivering therapy when step (d) indicates that therapy should be delivered.

3. The method of claim 2, wherein step (e) comprises:

delivering overdrive pacing.

4. The method of claim 1, wherein step (d) comprises:

determining that preventive therapy should be delivered when the difference is greater than the morphology threshold; and

determining that preventive therapy should not be delivered when the difference is less than the morphology threshold.

5. The method of claim 2, further comprising a step after step (e) of:

narrowing said morphology threshold when a ventricular arrhythmia is detected after determining that preventative therapy should not be delivered.

6. The method of claim 1, further comprising before step (c):

determining a difference between coupling intervals of the at least two PVCs; and

comparing the difference between the coupling intervals to a predetermined coupling interval threshold.

7. The method of claim 6, wherein step (d) further comprises:

determining that preventive therapy should not be delivered when the difference between the coupling intervals is less than the predetermined coupling interval threshold.

8. The method of claim 7, further comprising after step (d):

reducing said coupling interval threshold when a ventricular arrhythmia is detected after determining that preventative therapy should not be delivered.

9. The method of claim 8, wherein said coupling intervals are P-R coupling intervals.

10. The method of claim 8, wherein said coupling intervals are R-R coupling intervals.

11. The method of claim 1, wherein step (b) comprises

i. aligning a QRS complex from each of the at least two PVCs;

ii. measuring a difference in areas under QRS waveforms in the

QRS complexes; and

iii. assigning a match score that is proportional to the difference in step (ii).

12. The method of claim 11, wherein said predetermined morphology threshold is an average match score of at least two non-PVC beats.

13. An apparatus configured to detect and prevent ventricular arrhythmias, comprising:

detecting means configured to detect at least two premature ventricular contractions (PVCs);

processing means configured to determine a difference between morphologies of each of the at least two PVCs;

comparing means configured to compare said difference to a predetermined morphology threshold; and

delivering means configured to deliver preventative therapy based on said comparison.

14. The apparatus of claim 13, wherein said delivering means is configured to deliver preventative therapy if the difference between the morphologies is greater than the predetermined morphology threshold.

15. The apparatus of claim 13, wherein said processor means is further configured to narrow the predetermined morphology threshold when a ventricular arrhythmia is detected after the difference between the morphologies is determined to be less than the predetermined morphology threshold.

16. The apparatus of claim 13, wherein:

said processing means is further configured to determine a difference

between coupling intervals of each of the at least two PVCs; and

said comparing means is further configured to compare said difference between the coupling intervals to a predetermined coupling interval threshold.

17. An implantable cardiac device, comprising:

a sensing circuit configured to sense at least two premature ventricular contractions (PVCs);

a comparing circuit configured to compare a difference between morphologies of each of the at least two PVCs to a predetermined morphology threshold; and

a pacing circuit configured to deliver preventative therapy based on said comparison.

18. The device of claim 17, wherein said pacing circuit is configured to deliver the preventative therapy when the difference between the morphologies is greater than the predetermined morphology threshold.

19. The device of claim 17, further comprising a control system configured to reduce the predetermined morphology threshold when a ventricular arrhythmia is detected after the difference between the morphologies is determined to be less than the predetermined morphology threshold.

20. The device of claim 17, wherein said comparing circuit is further configured to compare a difference between coupling intervals of each of the at least two PVCs to a predetermined coupling interval threshold.

21. The device of claim 20, wherein said pacing circuit is configured to deliver preventative therapy when the difference between the coupling intervals is greater than the predetermined coupling interval threshold.

22. The device of claim 20, further comprising a control system configured to reduce the predetermined coupling interval threshold when a ventricular arrhythmia is detected after the difference between the coupling intervals is determined to be less than the predetermined coupling interval threshold.

23. A method of detecting and preventing ventricular arrhythmias, comprising:

a. detecting at least two premature ventricular contractions (PVCs);

b. determining a difference between coupling intervals of the at least two PVCs;

c. comparing said difference between coupling intervals to a predetermined coupling interval threshold;

d. determining a difference between morphologies of the at least two PVCs;

e. comparing said difference between morphologies to a predetermined morphology threshold; and

f. determining whether to deliver preventative therapy based on said comparing steps (c) and (d).

24. The method of claim 23, further comprising the step of:

g. delivering therapy when step (f) indicates that therapy should be delivered.

25. The method of claim 24, wherein step (g) comprises:
delivering overdrive pacing.

26. The method of claim 23, wherein step (f) comprises:
determining that preventative therapy should be delivered when the difference between coupling intervals is greater than the coupling interval threshold and the difference between morphologies is greater than the

morphology threshold; and

determining that preventative therapy should not be delivered when the difference between coupling intervals is less than the coupling interval threshold or the difference between morphologies is less than the morphology threshold.

27. A method of detecting and preventing ventricular arrhythmias, comprising:

a. detecting at least two premature ventricular contractions (PVCs);

b. determining a difference between coupling intervals of the at least two PVCs;

c. comparing said difference between coupling intervals of said at least two PVCs to a coupling interval threshold;

d. repeating steps (a) – (c) when said difference between coupling intervals is less than the coupling interval threshold; and

e. comparing a difference in morphologies of said at least two PVCs to a morphology threshold when said difference between coupling intervals is greater than the coupling interval threshold.

28. The method of claim 27, further comprising:

e. delivering therapy when said difference in morphologies is greater than the morphology threshold.

APPENDIX OF EVIDENCE
ON APPEAL IN PATENT APPLICATION OF
YELENA NABUTOVSKY, SERIAL NO. 10/687,846

This is an evidence appendix in accordance with 37 CFR § 41.37(c)(1)(ix). There is in this case no evidence submitted pursuant to 37 CFR §§ 1.130. 1.131, or 1.132, nor is there in this case any other evidence entered by the examiner and relied upon by the appellants.

RELATED PROCEEDINGS APPENDIX
ON APPEAL IN PATENT APPLICATION OF
YELENA NABUTOVSKY, SERIAL NO. 10/687,846

This is a related proceeding appendix in accordance with 37 CFR § 41.37(c)(1)(x). There are no decisions rendered by a court or the Board in any proceedings identified pursuant to 37 CFR § 41.37(c)(1)(ii).